

**IN THE CLAIMS:**

Please amend the claims as follows:

1.     **(Currently Amended)**     A film-forming apparatus comprising:

a gas-mixing chamber for admixing a raw gas and a reactive gas;

a film-forming chamber connected to the gas-mixing chamber;

a gas mixture supply port defined only by opposing surfaces of the gas-mixing and film-forming chambers;

a circular shower head disposed at a top face of the film-forming chamber and having a plurality of gas-injection holes defined therethrough, each gas-injection hole directly opposing the gas-mixing chamber;

a stage for placing thereon a substrate to be processed, the stage being disposed inside the film-forming chamber and moveable in an up and down manner;

an exhaust port for discharging an exhaust gas from inside the film-forming chamber to outside of the film-forming chamber, the exhaust port being formed through a wall surface of the film-forming chamber in a position below the stage at a time of film formation, the exhaust gas generated in a space defined by the shower head and an upper face of the stage is discharged out of the exhaust port through a clearance between a side wall of the film-forming chamber and the stage; and

a gas mixture prepared in the gas-mixing chamber being introduced into the film-forming chamber through the shower head, thereby forming a film on the substrate to be processed,

wherein **[[a]]** the gas mixture supply port is in fluid communication ~~between~~ with the gas-mixing chamber and the shower head and is located on a radially extending line of the shower head, and

wherein the gas mixture supply port is so constructed and arranged that the gas mixture to be supplied from the gas-mixing chamber flows in direct contact with, and only from outside a circumferential outer perimeter of, the upper surface of the shower head and the gas-injection holes toward a central portion along the upper surface of the shower head.

Claim 2        **(Canceled).**

3.        **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein when the flow rate of the gas mixture is large, the shower conductance is small and the gas mixture is injected into the film-forming chamber from a central portion of the shower head (hereunder referred to as "central gas injection") upon the formation of the film, wherein the shower head has a relatively large diameter, that the distance between the shower head and the substrate to be processed is increased or that the shower head having the relatively large diameter is used and the distance between the shower head and the substrate to be processed is increased, to thus prevent the central gas injection of the gas mixture and to make the manner of a gas injection of the gas mixture uniform.

4.        **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein when the flow rate of the gas mixture is small, the shower conductance is large and the gas mixture is injected into the film-forming chamber from the shower head and into a region above the substrate to be processed from the periphery of the

shower head (hereunder referred to as "peripheral gas injection") upon the formation of the film, wherein the shower head has a relatively small diameter, that the distance between the shower head and the substrate to be processed is reduced or that the shower head having the relatively small diameter is used and the distance between the shower head and the substrate to be processed is reduced, to thus prevent the peripheral gas injection of the gas mixture and to make the manner of the gas injection of the gas mixture uniform.

5. **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein an inner diameter of the film-forming chamber and a diameter of the shower head satisfy the following relation:

$(\text{diameter of the shower head}) \times 1.5 \leq (\text{inner diameter of the film-forming chamber}) \leq (\text{diameter of the shower head}) \times 2.5$ .

6. **(Previously Presented)** The film-forming apparatus as set forth in claim 5, wherein a pressure in the film-forming chamber, the diameter of the shower head and an overall flow rate of gases upon the formation of the film satisfy the following relations, respectively:

a)  $2 \text{ Torr} < (\text{pressure in the film-forming chamber}) < 10 \text{ Torr}$

b)  $\text{diameter of the substrate to be processed} < (\text{diameter of the shower head}) \times 1.5$  and

c)  $2500 \text{ sccm} < (\text{overall flow rate of gases}) < 7000 \text{ sccm}$ .

Claim 7. **(Canceled)**.

8. **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein a pressure in the film-forming chamber, a diameter of the shower head and an overall flow rate of gases upon the formation of the film satisfy the following relations, respectively:

a)  $2 \text{ Torr} < (\text{pressure in the film-forming chamber}) < 10 \text{ Torr}$

b)  $\text{diameter of the substrate to be processed} < (\text{diameter of the shower head}) \times 1.5$  and

c)  $2500 \text{ sccm} < (\text{overall flow rate of gases}) < 7000 \text{ sccm}$ .

9. **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein a clearance for exhaustion satisfies the relation represented by the following equation:

$$0.02 \text{ m}^3/\text{s} < \text{Exhaustion Conductance} < 0.08 \text{ m}^3/\text{s}.$$

10. **(Previously Presented)** The film-forming apparatus as set forth in claim 9, wherein a pressure in the film-forming chamber, a diameter of the shower head and an overall flow rate of gases upon the formation of the film satisfy the following relations, respectively:

a)  $2 \text{ Torr} < (\text{pressure in the film-forming chamber}) < 10 \text{ Torr}$

b)  $\text{diameter of the substrate to be processed} < (\text{diameter of the shower head}) \times 1.5$  and

c)  $2500 \text{ sccm} < (\text{overall flow rate of gases}) < 7000 \text{ sccm}$ .

11. **(Previously Presented)** The film-forming apparatus as set forth in claim 1, wherein a gas ring is disposed at a periphery of the top face of the film-forming chamber so that an inert gas, which is not directly involved in the film formation, can

uniformly be introduced into the film-forming chamber through the gas ring and along an inner surface of the side wall of the film-forming chamber.

Claim 12. (Canceled).

13. **(Currently Amended)** A film-forming apparatus, which comprises:  
a load-lock chamber for stocking wafers conveyed from a wafer cassette in the atmospheric conditions;  
a film-forming chamber;  
a conveyer chamber positioned between the load-lock chamber and the film-forming chamber;  
a gas-mixing chamber for admixing a raw gas and a reactive gas positioned on the upstream side of the film-forming chamber;  
a gas mixture supply port defined only by opposing surfaces of the gas-mixing and film-forming chambers;  
a shower head arranged at a top face of the film-forming chamber and having a plurality of gas-injection holes defined therethrough, each gas-injection hole directly opposing the gas-mixture chamber; and  
a stage arranged in the film-forming chamber for placing a substrate to be processed and movable in an up and down manner, in which a gas mixture prepared in the gas-mixing chamber is introduced into the film-forming chamber through the shower head to thus form a film on the substrate via **[[a]]** the gas mixture supply port which is in fluid communication ~~between~~ with the gas-mixing chamber and the shower head and is located on a radially extending line of the shower head,

wherein an exhaust port for discharging the exhaust gas from the film-forming chamber to outside of the film-forming chamber is formed through a wall surface of the film-forming chamber in a position below the stage at a time of film formation, the exhaust gas generated in a space defined by the shower head and an upper face of the stage is discharged out of the exhaust port through a clearance between a side wall of the film-forming chamber and the stage, and

wherein the gas mixture supply port is so constructed and arranged that the gas mixture to be supplied from the gas-mixing chamber flows in direct contact with, and only from outside a circumferential outer perimeter of, the upper surface of the shower head and the gas-injection holes toward a central portion along the upper surface of the shower head.